Dynamic Traffic and Safety Management in Brussels
Presentation Overview

• Study area
• Objectives
• Methodology
  – Diagnosis
  – Scenarios
  – Proposals for VMS locations
  – Selection and installation of the VMS
• Conclusion
The study area

• Brussels Capital Region:
  – 19 municipalities
  – Surface area: 162 km²
  – Total population: 1.018.000
  – Jobs: 682.000
  – Schoolchildren: 241.000
  – Cars: 343.000
  – Road network: 1881km
  – Road managing: 331km.
    • Motorways (black)
    • Metropolitain roads (red)
    • Main roads (orange)
The study area

- Brussels traffic situation and projection

Congestion between 8h-9h in 2001

Congestion between 8h-9h in 2015

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Objectives

• To inform road users in real time
  – On present traffic conditions
  – On potential hazards

  ► ↑ security
  ► ↓ pollution

• Multi-modal possibilities
  - Information on public transports
  - Parking possibilities

• Technological solution: the Variable Message Signs (VMS)
  – Big challenge: the maximum information with minimum of VMS
Methodology

• Collecting informations (diagnosis)
• Determination of interventions scenarios
• Proposals for VMS locations
• Selection and installation of the VMS
Diagnosis

- Existing equipment for dynamic management:
  - 51 VMS (tunnels)
    - In tunnels
    - Pivotable flap signs
      - provide information
  - Detection systems:
    - Detection loops
    - Cameras
      - provide input data
Diagnosis

• Events on the network:
  – Damage-only and personal injury accidents
  – Traffic problems
  – Social demonstrations
  – Sporting events
  – Hazardous spots

Meetings with police, mobility managers, municipalities

► 45 locators
Scenarios

• The logic of rings:
  – Pentagon (the city center)
  – Ring motorway
  – Two more rings (not complete)

► Geometric structure of the study area
Scenarios

Gradation of scenarios with four different levels

– Level 0: action at the link level
– Level 1: as level 0 + the upstream ring
– Level 2: as level 1 + the upstream ring
– Level 3: as level 2 + the upstream ring

Ex: locator n°43. If scenario of level 1 → action at the link level (red ring) + the upstream ring (pink ring)
• The logic of scenarios: three components:
  – Information
  – Rerouting
  – Special
Scenarios

• Determination of scenarios:

  *Determination table*

<table>
<thead>
<tr>
<th>The locator</th>
<th>The Incident</th>
<th>Scenario level</th>
</tr>
</thead>
</table>

Four types of incident:
– Traffic disruption
– Fire
– Works
– Accident
Scenarios

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Proposals for VMS locations

• Analysis of each locator:
  For each of 45 locators:
  – Analysis of scenarios for all possible type of incident
  – Propositions of display on the VMS
  – Propositions of a location for the VMS
  – Suggestion of diversion routes
Proposals for VMS locations

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<table>
<thead>
<tr>
<th>Number</th>
<th>Type</th>
<th>Information</th>
<th>Rerouting Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2&gt;1</td>
<td>Véhicule arrêté</td>
<td>pas de rerouting proposé car 1 bande reste ouvert</td>
</tr>
<tr>
<td>2</td>
<td>2&gt;1</td>
<td>File</td>
<td>pas de rerouting proposé car 1 bande reste ouvert</td>
</tr>
<tr>
<td>1</td>
<td>2&gt;1</td>
<td>Piéton sur chaussée</td>
<td>pas de rerouting proposé car 1 bande reste ouvert</td>
</tr>
<tr>
<td>1</td>
<td>2&gt;1</td>
<td>Objet sur chaussée</td>
<td>pas de rerouting proposé car 1 bande reste ouvert</td>
</tr>
<tr>
<td>1</td>
<td>2&gt;1</td>
<td>Véhicule fantôme</td>
<td>pas de rerouting proposé car 1 bande reste ouvert</td>
</tr>
<tr>
<td>2</td>
<td>2&gt;1</td>
<td>Animal errant</td>
<td>pas de rerouting proposé car 1 bande reste ouvert</td>
</tr>
<tr>
<td>2</td>
<td>2&gt;1</td>
<td>Incident</td>
<td>pas de rerouting proposé car 1 bande reste ouvert</td>
</tr>
<tr>
<td>3</td>
<td>2&gt;1</td>
<td>Manifestation</td>
<td>pas de rerouting proposé car 1 bande reste ouvert</td>
</tr>
</tbody>
</table>

Source: carte Michelin 44

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### Proposals for VMS locations

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#### Table: VMS Locations Proposals

<table>
<thead>
<tr>
<th>Number</th>
<th>Type</th>
<th>Description</th>
<th>Rerouting</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>FIRE</td>
<td>![Fire Icon]</td>
<td>![Rerouting Icon]</td>
<td>![Special Icon]</td>
</tr>
<tr>
<td>3</td>
<td>FIRE</td>
<td>![Fire Icon]</td>
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</tr>
</tbody>
</table>

**Diagram:**

- **Locator 23**
- **Fire:** 3
- **Works:** 0, 1, 2, 3
- **Accident:** 1, 2, 3

**Rerouting Options:**
- ![Rerouting Icon]

**Special Measures:**
- ![Special Icon]

**Message:**

- **BLOC 3 TUNNEL CINQUANTE ANS**
- **BLOC 3 ABRÉGRÉ TUN. CINQUANTE ANS**

**Transport:**

- **M1-M2**
- **TUNNEL CINQUANTE ANS**
- **BLOC 1**
- **BLOC 3**
- **BXL CENTRE PRENDRE R6 6411 CH DE WAYRE**
- **BXL CENTRE PRENDRE R6 6411 CH DE WAYRE**

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Proposals for VMS locations

• Choice of VMS location:
  – 174 signs
  – 6 different model of signs
Proposals for VMS locations

- Different types of VMS (mainly full-matrix diode screens)

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Proposals for VMS locations

• Operation of the various signs:
Selection and installation of the VMS

- Priority of the VMS implantation, based on:
  - The size of the incidents
  - The development projects planned
  - The available detection components

For each VMS selected, simulation of implantation:

Not yet VMS of this type in Brussels
Conclusion

• A specific study is first necessary to know the mobility problems, their causes and their consequences
• Such a study is complex due to the great number of incidents
• The dynamic technologies in real time needs real-time information sources which are sometimes scarce or unavailable
• Consultation between specialists of management systems and field people (police, municipalities, mobility managers) is very important
Selection and installation of the VMS

Thank you for your attention

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